



Calhoun: The NPS Institutional Archive
DSpace Repository

Multimedia

Video

2016-04-22

A multi-physics approach to energy and demonstration facility [video]

Gannon, Anthony J.

Naval Postgraduate School, Monterey, California

<http://hdl.handle.net/10945/48748>

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>

A Multi-physics Approach to Energy and Demonstration Facility

22 April 2016 – ME Lecture Hall – 1300

Dr. Anthony J Gannon

Assistant Professor, MAE Department,
Naval Postgraduate School



Dr. Anthony J Gannon

Abstract:

A methodology to investigate the generation, transport, and storage of energy based on a multi-physics approach tied to the end use application, is presented. Often little or no consideration is given to the end use or desired product of the energy used. Current energy generation, transport, and storage are dominated heavily by a few large sectors, notably electricity and hydrocarbons. This is not surprising as they are incredibly effective, but rely on a centralized model. Small scale generation in microgrids tends to continue this model with energy storage being a mix of hydrocarbons and battery storage.

A paradigm shift in the thinking and design of energy systems based on the required end use or product is needed. The philosophy and motivation that lead to the consideration of this new approach are outlined in this lecture. Following this part of the lecture we present a summary of a methodical approach to developing the most energy and cost-effective solution to general processes by considering their end-use physics. Examples of innovative energy generation, storage, and transport solutions based on the multi-physics approach are then outlined. Finally, a brief description of NPS's Multi-physics Renewable Energy Lab (MPREL) is given. MPREL is a demonstration facility based on this approach and currently under construction.

Biography:

Dr. Gannon is an Assistant Professor in Mechanical and Aerospace Engineering Department at the Naval Postgraduate School. His area of research interest is in renewable energy, solar thermal cycles, heat transfer, gas turbines, and turbomachines. He earned his Bachelor's degree in Mechanical Engineering from the University of Natal, Durban, South Africa; he earned his Master's degree and PhD in Mechanical Engineering from the University of Stellenbosch, Western Cape, South Africa. He is a member of the American Society of Mechanical Engineers (ASME).



NAVAL
POSTGRADUATE
SCHOOL